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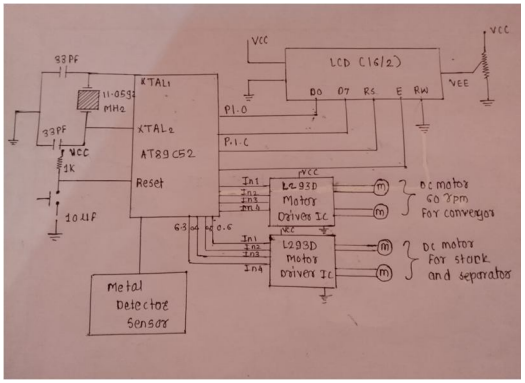
Review Paper on Microcontroller Based Object Sorting

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Abstract: ***Sorting of products is a very difficult industrial process. Continuous manual sorting creates consistency issues. This paper describes a working prototype designed for automatic sorting of objects based on the metal detector KY-036 sensor was used to detect the colour of the product and the PIC16F628A microcontroller was used to control the overall process. The identification of the colour is based on the frequency analysis of the output of TCS230 sensor. One conveyor belts were used, it controlled by separate DC motors. The belt is for placing the product to be analysed by the colour sensor, having separated compartments, in order to separate the products. The experimental results promise that the prototype will fulfil the needs for higher production and precise quality in the field of automation.***
Keywords: colour sorting, Conveyor belt, DC motor, PIC 16F628A, TCS230 magnetic detector

I. INTRODUCTION

Machines can perform highly repetitive tasks better than humans. Worker fatigue on assembly lines can result in reduced performance, and cause challenges in maintaining product quality. An employee who has been performing an inspection task over and over again may eventually fail to recognize the colour of product. Automating many of the tasks in the industries may help to improve the efficiency of manufacturing system. The purpose of this model is to design and implement a system which automatically separates products based on their colour. This machine consists of three parts: conveyor belt, magnetic detector, and dc motor. The output and input of these parts was interfaced using PIC microcontroller. To reduce human efforts on mechanical manoeuvring different types of sorting machines are being developed. These machines are too costly due to the complexity in the fabrication process. A common requirement in the field of colour sorting is that of magnetic detector and identification.



II. LITERATURE REVIEW

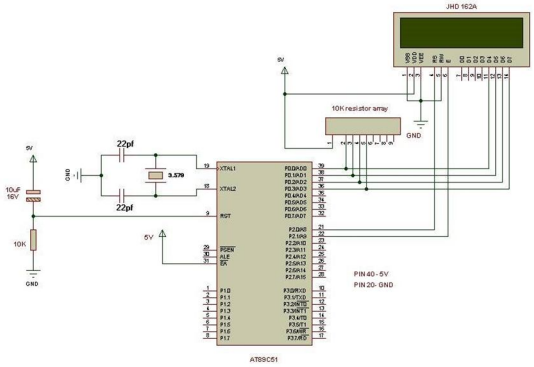
Metal detector is a device which response to metal that may not be readily apparent. The simplest form of a metal detector consist of an oscillator producing an altering current that passes through a coil producing and alternating magnetic field. If a piece of electrically conduct metal is close to the coil, eddy currents will be induced in the metal, and this produces altering magnetic field its own. If another coil used to measure the magnetic field(acting as a magneto meter), the change in the magnetic field due to the metalic object can be detected.

A gold metal detector for example is designed to locate gold undergound there are many types of metal detector with varying degree's of refinement and complexity but they are operate on the same basic principle.

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III. METHODOLOGY

When a supply of 3.4V is given to the DC motor (12V, 3.5rpm) it starts to rotate. It will control the movement of the conveyor belt on which the product is placed. When the light falls on the product it is reflected back to the magnetic detector. which is opted by its select pins. Filters are selected by the program the microcontroller. Frequency output from magnetic detector depends on the detect of the object as well as the select pin configuration input from microcontroller. Select pin can select one of the four photo diode filters which can give output according to the detect of the object. When there is no object in front of sensor it produces an output of 330Hz range frequency and when there is an object it produces an output frequency of 7-14 KHz. If there is an object the produces an output frequency which is proportional to the detect of the object and the selected photo diode configuration in such a way that it provides maximum frequency for the respective colour to the respective photo diode. Hence detect gives maximum frequency for object when red filter is selected, and in the same way other detector object are also sensed by corresponding filters. Frequency received during each filter selection is counted and saved to separate registers and these values are examined for taking the greater one, in order to identify the object. The container has three sections; first section for Green, middle for Black, and third for Red. According to the color, the container will be moved in forward or backward direction by the conveyor belt, which is made possible by connecting the DC motor to L293D hybrid IC. The products will finally fall to the corresponding sections in the container. The PIC has 18 pins, out of which five pins are connected to magnetic detector, and two pins are connected to L293D IC.



IV. CONCLUSION

As mentioned before we have used objects of standard size and having any of the for testing our prototype. We conducted a continuous trail with 100 objects and we got 100% correct detection. As long as the detect of the objects do not deviate from the preset values and as long as the placement on the belt is perfect, the detection process seldom fails.

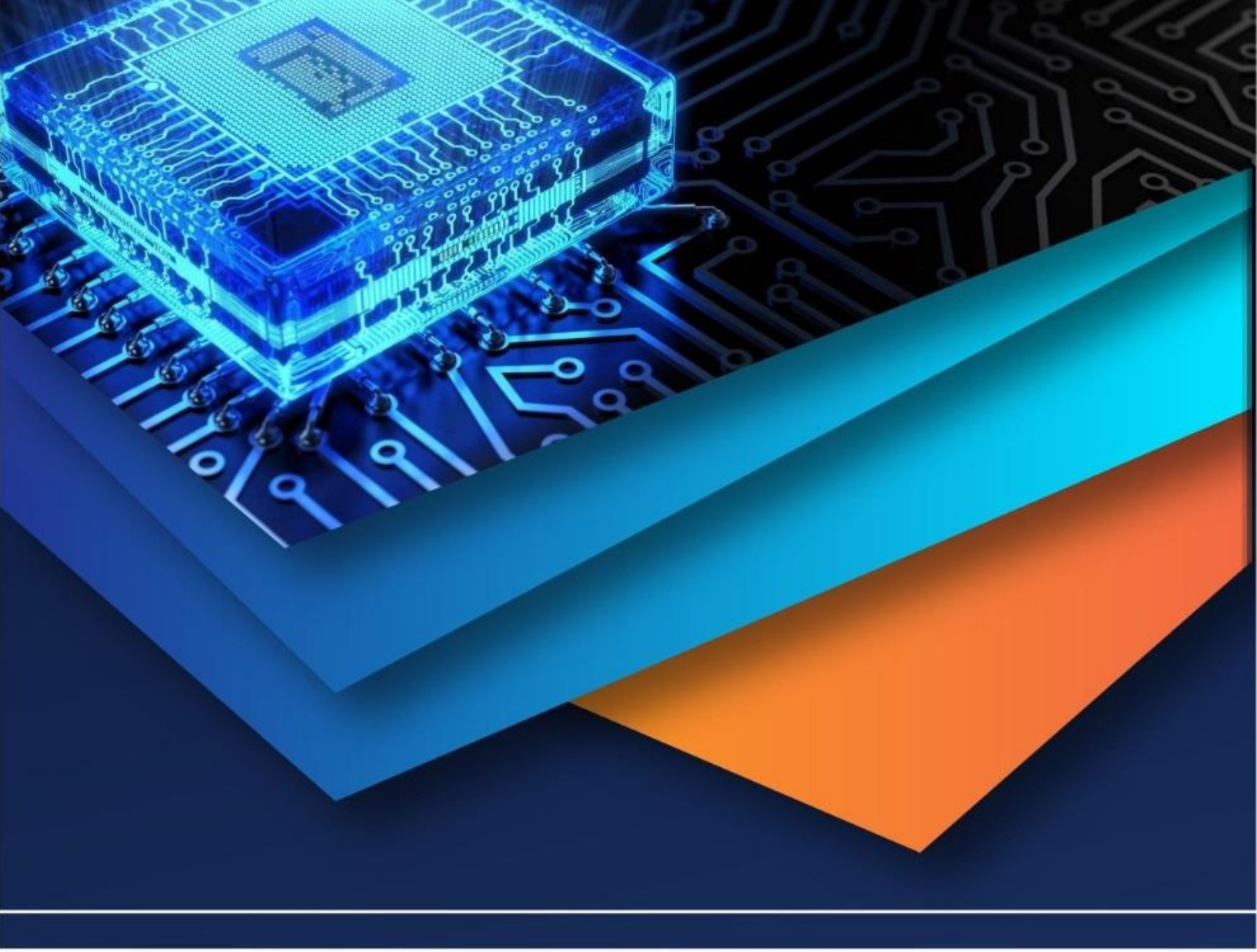
V. RESULT

Depending on the machine requirement
Object are turned by proximity sensor then
Motor is sorting properly metal object and
Wooden object
As per requirement object are sorted properly.

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